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09/680,370	10/05/2000	Claus Schneider	GR 99 P 5005	8230

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EXAMINER
STEELMAN, MARY J

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DATE MAILED: 09/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>1/18/2001, 1/21/2003</u>.

2a)☐ This action is **FINAL**.　　2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>35-65</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>35-65</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>05 October 2000</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All　b)☐ Some * c)☐ None of:

　　　1.☒ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
　　　　application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
　　Paper No(s)/Mail Date <u>01/23/2003</u>.

4)☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

1.   Per Applicant's request 15 June 2001, claims 1-34 have been canceled. Claims

35-65 have been added. Claims 35-65 are pending.

Priority

2.   Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which

papers have been placed of record in the file.

Information Disclosure Statement

3. IDS received 28 January 2003 has been considered.

Drawings

4.   The informal drawings are not of sufficient quality to permit examination.

Accordingly, replacement drawing sheets in compliance with 37 CFR 1.121(d) are

required in reply to this Office action. The replacement sheet(s) should be labeled

"Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any

portion of the drawing figures. If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next

Office action.

Applicant is given a TWO MONTH time period to submit new drawings in

compliance with 37 CFR 1.81. Extensions of time may be obtained under the provisions

of 37 CFR 1.136(a). Failure to timely submit replacement drawing sheets will result in

ABANDONMENT of the application.

5.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because

reference characters, as an example, 4, 5, 6, and 7 have both been used to designate

different columns (rows of the second dimension). Corrected drawing sheets in

compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character, as an example, 7 and 8 reference the same cell. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7.   The drawings and descriptions are not clear.

Specification

8.   Applicant is reminded of the proper form of the Specification. Specification should be double spaced.

9.   The spacing of the lines of the specification is such as to make reading and entry

of amendments difficult. New application papers with lines double spaced on good

quality paper are required.

10.   Abstract should be limited to 150 words.

Content of Specification

(a)   Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of
        the invention should be placed at the top of the first page of the
        specification unless the title is provided in an application data sheet. The
        title of the invention should be brief but technically accurate and
        descriptive, preferably from two to seven words may not contain more
        than 500 characters.

(b)   Cross-References to Related Applications: See 37 CFR 1.78 and MPEP
        § 201.11.

(c)   Statement Regarding Federally Sponsored Research and Development:
        See MPEP § 310.

(d)   Incorporation-By-Reference Of Material Submitted On a Compact Disc:
        The specification is required to include an incorporation-by-reference of
        electronic documents that are to become part of the permanent United
        States Patent and Trademark Office records in the file of a patent
        application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program
        listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and
        tables having more than 50 pages of text were permitted as electronic
        documents on compact discs beginning on September 8, 2000.

        Or alternatively, Reference to a "Microfiche Appendix": See MPEP §
        608.05(a). "Microfiche Appendices" were accepted by the Office until
        March 1, 2001.

(e)   Background of the Invention: See MPEP § 608.01(c). The specification
        should set forth the Background of the Invention in two parts:

        (1)   Field of the Invention: A statement of the field of art to which the
                invention pertains. This statement may include a paraphrasing of
                the applicable U.S. patent classification definitions of the subject
                matter of the claimed invention. This item may also be titled
                "Technical Field."

(2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."

(f) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

(g) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.

(h) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

(i) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).

(j) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less

commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).

(k)   Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

Claim Objections

11.   Claims 65, 66, and 67 recite, "The table according to claim 58...", should be –The table according to claim 59...-- Examiner will treat claims 65-67 as if they depended from claim 59.

12.   Claims 35 and 51 recite, "...(4, 11, 14, 17, 21, 25, 34)...". These numbers and parenthesis should be deleted.

13.   Claim 64 is objected to because it does not end with a '.'. Add a period to the end of the sentence.

14.   Claim 68 is objected to because it ends with '--.'. Delete the two dashes and period.

Claim Rejections - 35 USC § 112

15.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

16.   Claim 38-42, 52-56, 59-65, and 68 rejected under 35 U.S.C. 112, second

paragraph, as being indefinite for failing to particularly point out and distinctly claim the

subject matter which applicant regards as the invention.

17.   Claims 38-41, 52-55, 59-64 and 68 recite the limitations "row / rows". There is

insufficient antecedent basis for this limitation in the claim, as it is impossible to discern

whether the row is "in the first dimension" or in "the second dimension".

18.   Claims 42 and 56 recite the limitation "title rows". There is insufficient

antecedent basis for this limitation in the claim, as it is impossible to discern whether the

row is "in the first dimension" or in "the second dimension".

Claim Rejections - 35 USC § 101

19.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

20.   Claims 59-68 are rejected under 35 U.S.C. 101 because

the claimed invention is directed to non-statutory subject matter. Independent claim 59

and dependent claims 60-68 are directed towards nonstatutory subject matter.

Nonstatutory Subject Matter

Claims to computer-related inventions that are clearly nonstatutory fall into the same

general categories as nonstatutory claims in other arts, namely natural phenomena such as

magnetism, and abstract ideas or laws of nature which constitute "descriptive material."

Abstract ideas, Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759, or the mere

manipulation of abstract ideas, Schrader, 22 F.3d at 292-93, 30 USPQ2d at 1457-58,

are not patentable. Descriptive material can be characterized as either "functional

descriptive material" or "nonfunctional descriptive material." In this context, "functional

descriptive material" consists of data structures and computer programs which impart

functionality when employed as a computer component. (The definition of "data

structure" is "a physical or logical relationship among data elements, designed to support

specific data manipulation functions." The New IEEE Standard Dictionary of Electrical

and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material"

includes but is not limited to music, literary works and a compilation or mere

arrangement of data. Both types of "descriptive material" are nonstatutory when claimed

as descriptive material per se. Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759. When

functional descriptive material is recorded on some computer-readable medium it

becomes structurally and functionally interrelated to the medium and will be statutory in

most cases since use of technology permits the function of the descriptive material to be

realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed.

Cir. 1994) (claim to data structure stored on a computer readable medium that increases

computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d

at 1759 (claim to computer having a specific data structure stored in memory held

statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d

at 1760 (claim to a data structure per se held nonstatutory). When nonfunctional

descriptive material is recorded on some computer-readable medium, it is not statutory

since no requisite functionality is present to satisfy the practical application requirement.

Merely claiming nonfunctional descriptive material stored in a computer-readable

medium does not make it statutory. Such a result would exalt form over substance. In re

Sarkar, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978) ("[E]ach invention must

be evaluated as claimed; yet semantogenic considerations preclude a determination based

solely on words appearing in the claims. In the final analysis under 101, the claimed

invention, as a whole, must be evaluated for what it is.") (quoted with approval in Abele,

684 F.2d at 907, 214 USPQ at 687).　See also In re Johnson, 589 F.2d 1070, 1077,

200 USPQ 199, 206 (CCPA 1978) ("form of the claim is often an exercise in drafting").

Thus, nonstatutory music is not a computer component and it does not become statutory

by merely recording it on a compact disk. Protection for this type of work is provided

under the copyright law.　Claims to processes that do nothing more than solve

mathematical problems or manipulate abstract ideas or concepts are more complex to

analyze and are addressed below.　If the "acts" of a claimed process manipulate only

numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts

are not being applied to appropriate subject matter. Schrader, 22 F.3d at 294-95, 30

USPQ2d at 1458-59. Thus, a process consisting solely of mathematical operations, i.e.,

converting one set of numbers into another set of numbers, does not manipulate

appropriate subject matter and thus cannot constitute a statutory process.

In practical terms, claims define nonstatutory processes if they:

– consist solely of mathematical operations without some claimed practical application

(i.e., executing a "mathematical algorithm"); or

– simply manipulate abstract ideas, e.g., a bid (Schrader, 22 F.3d at 293-94, 30

USPQ2d at 1458-59) or a bubble hierarchy (Warmerdam, 33 F.3d at 1360, 31

USPQ2d at 1759), without some claimed practical application.

Cf. Alappat, 33 F.3d at 1543 n.19, 31 USPQ2d at 1556 n.19 in which the Federal

Circuit recognized the confusion:

The Supreme Court has not been clear . . . as to whether such subject matter is

excluded from the scope of 101 because it represents laws of nature, natural

phenomena, or abstract ideas. See Diehr, 450 U.S. at 186 (viewed mathematical

algorithm as a law of nature); Gottschalk v. Benson, 409 U.S. 63, 71-72 (1972)

(treated mathematical algorithm as an "idea"). The Supreme Court also has not

been clear as to exactly what kind of mathematical subject matter may not be

patented. The Supreme Court has used, among others, the terms "mathematical

algorithm," "mathematical formula," and "mathematical equation" to describe types

of mathematical subject matter not entitled to patent protection standing alone. The

Supreme Court has not set forth, however, any consistent or clear explanation of

what it intended by such terms or how these terms are related, if at all.

Certain mathematical algorithms have been held to be nonstatutory because they

represent a mathematical definition of a law of nature or a natural phenomenon. For

example, a mathematical algorithm representing the formula $E = mc2$ is a "law of nature"

— it defines a "fundamental scientific truth" (i.e., the relationship between energy and

mass).

To comprehend how the law of nature relates to any object, one invariably has to perform

certain steps (e.g., multiplying a number representing the mass of an object by the square

of a number representing the speed of light). In such a case, a claimed process which

consists solely of the steps that one must follow to solve the mathematical representation

of $E = mc2$ is indistinguishable from the law of nature and would "preempt" the law of

nature. A patent cannot be granted on such a process.

(a) Functional Descriptive Material: "Data Structures" Representing Descriptive Material Per Se or Computer Programs Representing Computer Listings Per Se

Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer. See, e.g., Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory. Similarly, computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions. Computer programs are often recited as part of a claim. Office

personnel should determine whether the computer program is being claimed as part of an

otherwise statutory manufacture or machine. In such a case, the claim remains statutory

irrespective of the fact that a computer program is included in the claim. The same result

occurs when a computer program is used in a computerized process where the computer

executes the instructions set forth in the computer program. Only when the claimed

invention taken as a whole is directed to a mere program listing, i.e., to only its

description or expression, is it descriptive material per se and hence nonstatutory. Since a

computer program is merely a set of instructions capable of being executed by a

computer, the computer program itself is not a process and Office personnel should treat

a claim for a computer program, without the computer-readable medium needed to

realize the computer program's functionality, as nonstatutory functional descriptive

material. When a computer program is claimed in a process where the computer is

executing the computer program's instructions, Office personnel should treat the claim as

a process claim. See paragraph IV.B.2(b), below. When a computer program is recited

in conjunction with a physical structure, such as a computer memory, Office personnel

should treat the claim as a product claim.

Claim Rejections - 35 USC § 103

21.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

22.   Claims 35-68 art rejected under 35 U.S.C. 103(a) as being unpatentable over US

Patent 5,513,119 to Moore et al.

35. A method for converting interface definitions within a source code program into an

intermediate format, which comprises:

-identifying with a computer system at least one object in a source code program;

identifying at least one interface in at least one identified object; determining

characteristics of the at least one interface including at least one of:

(Moore: Col. 2, line 62, "...system is supplied with various input design files...(input

source)" col. 4, lines 21-24, "To create the database, the input design files shown in FIG.

1 are read y the placement system to extract the necessary information...")

      -being an internal interface for producing a link from objects within the source

code program; being an external interface for producing a link from an object with

interfaces located outside the source code program; being an input interface; being an

output interface; and being an input/output interface;

      (Moore: Col. 2, lines 2-4, "...for connecting the design elements within the

integrated circuit...")

-identifying at least one link including:

      -at least one internal link between at least one output interface and at least one

input interface between at least two identified objects; and at least one external link of an

external interface;

      (Moore: Col. 3, lines 41-43, "The workspace window also shows pads

corresponding to the pins of the integrated circuit and the connections between the

groups. In the upper left corner is the design name and the number of design elements

selected...current position of the mouse...")

-creating an at least two dimensional intermediate format table having first rows (4, 11, 14, 17, 21, 25, 34) disposed in a first dimension, second rows disposed in a second dimension, and cells disposed at intersections of: the first and second rows;

(Moore: FIG. 4, col. 1, line 65, "…placement system creates a database…", col. 4, lines 51-55, "Reference is now made to FIG. 4 illustrating the database structure for the placement system. The following describes the various blocks used in the database, co0nnections between the blocks and the name of the file that the information is extracted…")

-assigning designations for each identified object to rows in the first dimension; assigning designations for each identified link to rows in the second dimension;

(Moore: Col. 2, lines 57-61, "The placement system also comprised of a database, which contains the information for defining the groups and input/output (i/o) buffers to be placed on an integrated circuit, the information required for grouping logic cells and the parameters of the integrated circuit…")

-inserting at least one of:

-designations for at least one output interface and input interface associated with both a respective identified object and an identified internal link in each of the cells located at the intersection of one of the rows in the first dimension with the designation of an identified object and one of the rows in the second dimension with the designation of an identified internal link; and

-designations for at least one output interface and input interface associated with both a respective identified object and an identified external link in each of the cells located at the intersection of one of the rows in the first dimension with the designation of an identified object and one of the rows in the second dimension with the designation of an identified external link.

(Moore: Col. 3, lines 44-45, "...design name and the number of the design elements selected...", col. 3, lines 49-51, "...display of groups, buffers or connections between the groups...", col. 4, Database Creation, line 39, col. 4, lines 41-42, "DEF (design exchange format) file describes the different cells and net connections in the design...", col. 4, lines 58-59, "nl – the names of the buffers and cells used in the design...", col. 4, lines 64-65, "devPkg – the package information. The package defines the master and the device pins associated with the package...")

Moore disclosed a system that reads input design files, creates a database of intermediate data. The database is then used to create the integrated circuit layout. While Moore did not specify exact row, column, locations for specific pieces of data, he did explicitly place and define design elements for the design area. Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the invention, to consider Moore's database translation system to be an obvious variation of the database translation system described in the instant application. Placement of data in one cell or another, is irrelevant. A searchable, logical storage location is provided by Moore to be used to convert source code into an intermediate format, in the form of a database, and further to convert into an object code program.

36. The method according to claim 35, which further comprises:

-indicating a mode of the external interface of at least one identified external link using a

first specific row in the first. dimension; and inserting details of the mode of the external

interface for the at least one identified external link in each of the cells located at an

intersection of the first specific row in the first dimension and the rows in the second

dimension with the designations of the at least one identified external link.

(Moore: Col. 5, lines 10-12, "buffers – the valid i/o buffer site information. The

location, orientation and pad names are defined for the buffers…")

37. The method according to claim 36, wherein the external interface is one of:

-an input interface; an output interface; a bidirectional interface; and an interface with an

undefined flow direction.

(Moore: Col. 3, lines 13-15, "The information in the database is read by the buffer

placement unit to display i/o buffers used for transferring datain and out of the integrated

circuit and allows the user to select appropriate locations for i/o buffers…")

38. The method according to claim 36, which further comprises:

-defining at least one data type of the at least one identified interface; assigning details of

the at least one data type of the at least one identified interface to at least one second

specific row in the first dimension; and inserting designations for the at least one data

type associated with the at least one identified link in each of the cells located at an

intersection of the second specific row and the rows in the second dimension having the

designations of the at least one identified link.

(Moore: Col. 7, line 56-col. 8, line 66, As an example, "components – the list of

component values. For each component member (data type), the instance name, cell

name, the fixed location and the basic cell size are defined...", col. 6, lines 40-44,

"mastLef_t – defines the i/o and macro cell information for the design...", col. 8, lines 4-

5, defines properties for the DEF component member.)

39. The method according to claim 38, which further comprises:

-identifying at least one constant, including:

       -a constant in the at least one identified object; and

       -an external constant to be used by all objects in the source code program;

-defining a data type of the at least one identified constant;

-assigning details of the data type of the at least one identified constant to at least one

third specific row in the first dimension;

-assigning designations of the at least one identified constant to at least one first specific

row in the second dimension; and

-inserting designations for the data type associated with the at least one identified

constant in each of the cells located at an intersection of the at least one third specific row

and the at least one first specific row in the second dimension with designations of the at

least one identified constant.

(Moore: As an example, col. 4, lines 26-28, "Master LEF file describes the valid buffer

and cell sites on an integrated circuit (master) and also describes the size of a basic cell

and buffer site.")

40. The method according to claim 39, which further comprises:

-defining one of a value and a method of calculation for the at least one identified

constant;

-assigning details of the one of the value and the method of calculation of the at least one

identified constant to at least one fourth specific row in the first dimension; and

-inserting the one of the value and the method of calculation of the at least one identified

constant in each of the cells located at an intersection of the at least one fourth specific

row and the first specific rows in the second dimension with designations of the at least

one identified constant.

(Moore: Col. 9, lines 25-27, "The Device and Buffer Coordinate files define the location

and orientation of each buffer site on the integrated circuit. The Master LEF file

describes the size of each buffer..." This information is found in the created database,

col. 4, line 20- col. 9, line 20.)

41. The method according to claim 40, which further comprises:

-defining one of a value and a method of calculation for the at least one identified link;

-assigning details of the one of the value and the method of calculation of the at least one

identified link to at least one fifth specific row in the first dimension; and

-inserting the one of the value and the method of calculation of the at least one identified

link in each of the cells located at an intersection of the at least one fifth specific row and

at least one of:

  -the rows in the second dimension with the designation of an identified internal

link; and

  -the rows in the second dimension with the designation of an identified external

link.

(Moore: Col. 9, lines 25-27, "The Device and Buffer Coordinate files define the location

and orientation of each buffer site on the integrated circuit. The Master LEF file

describes the size of each buffer..." This information is found in the created database,

col. 4, line 20- col. 9, line 20. Buffers are links.)

42. The method according to claim 35, which further comprises:

-identifying original designations in the source code program of at least one of:

  -the at least one object; the at least one link; and the at least one constant,

-assigning details of the identified original designations to specific title rows; and

-inserting the original designations into cells in the title rows.

(Moore: Col. 12, lines 21-23, The files are generated using the system database...", col.

12, lines 49-51, "Using input design files, the system creates a database, which defines

the design elements to be grouped and the groups to be placed on the design area...")

43. The method according to claim 35, which further comprises compiling the

designations of the at least one interface from an identifier for a respective interface and

at least one detail selected from the group consisting of:

-an identification of a mode of the at least one interface; a data type of the at least

one interface; a default value; and details of a data type conversion function to be applied

to the at least one interface.

(Moore: Abstract, lines 1-15, "A set of logic cells is hierarchically grouped to form

groups to be placed on an integrated circuit for gate array layout. A user interface allows

a user to interact with a placement system. The system is supplied with input design files

defining the integrated circuit, the cells to be grouped, the groups to be placed, and

input/output buffers to be placed on the perimeter of the integrated circuit for connecting

the groups with external circuitry. The system reads the input design files to create a

database used for placing desired input/output buffers and for hierarchically grouping the

cells and placing the groups...")

44. The method according to claim 35, which further comprises:

-identifying original designations in the source code program of the at least one interface;

and using the original designations as an identifier.

(Moore: Col. 3, lines 1-4, "...reading the input design files for creating the database, a

unit for using database information for placing i/o buffers on an integrated circuit under

user control, a unit for determining the size of an element group...")

45. The method according to claims 35, wherein the source code program is a code in a hardware description language.

(Moore: Col. 3, line 1, "…reading the input design files…")

46. The method according to claim 45, wherein the at least one object represents an interface entity of an electronic component.

(Moore: Col. 3, lines 24-25, buffer and integrated circuit.)

47. The method according to claim 45, wherein the at least one internal link represents a signal.

(Moore: Col. 4, lines 39-40, signal.)

48. The method according to claim 45, wherein the at least one external link represents a port.

(Moore: Col. 4, lines 64-66, package defines the master and the device pins associated with the package…)

49. The method according to claim 35, wherein at least one identified object has a sub source code program able to be converted into an intermediate format; and which further comprises converting the sub source code program to a sub format table and then inserting a cross-reference to the sub format table in a cell in a row in the first dimension associated with the converted object.

(Moore: Col. 4, lines 29-32, "Macro LEF file describes all of the macro cells

(characterized fixed layouts that implement a particular electric function) available in a

system library...", col. 2, lines 63-64, ...various input design files, which contain

previous design data as well as the librarian information for describing various available

elements...")

50. The method according to claim 35, which further comprises inserting a

cross-reference to at least one identified object stored as a separate unit as source code

program in a cell in the row in the first dimension associated with the stored object.

(Moore: Col. 4, lines 29-32, "...system library..." is referenced, col. 2, lines 63-64,

"...librarian information..." is referenced.)

51. A method for converting interface definitions from an at least two dimensional

intermediate format table into an object code program with a computer system, which

comprises:

-providing an at least two dimensional intermediate format table having first rows (4, 11,

14, 17, 21, 25, 34) disposed in a first dimension, second rows disposed in a second

dimension, and cells at intersections of the first and second rows;

-assigning designations for at least one object in rows in the first dimension;

-assigning designations for at least one internal link between at least one of:

 -objects; and

 -at least one external link of an object, in rows in the second dimension;

-inserting at least one of:

-designations for at least one of an internal output interface and an internal input interface associated with both a respective object and a link in each cell located at an intersection of one of the rows in the first dimension with the designation of an object and one of the rows in the second dimension with the designation of an internal link; and

-designations for at least one of an external output interface and an external input interface associated with both a respective object and an external link in each cell located at the intersection of one of the rows in the first dimension with the designation of an object and one of the rows in the second dimension with the designation of an external link;

-creating at least one program code object based on information about the at least one object contained in the intermediate format table;

-assigning at least one of associated internal output interfaces and associated internal input interfaces to a respective program code object;

-at least one of:

-creating at least one link between program code objects based on information about the internal links of the internal input interfaces and internal output interfaces contained in the intermediate format table; and

-assigning at least one of associated external output interfaces and associated external input interfaces to corresponding program code objects.

(See limitations addressed in claim 1 above. Also, col. 3, lines 2-4, col. 2, lines 19-21

Moore disclosed a system that reads input design files, creates a database of intermediate data. The database is then used to create the integrated circuit layout. While Moore did

not specify exact row, column, locations for specific pieces of data, he did explicitly

place and define design elements for the design area. Therefore, it would have been

obvious, to one of ordinary skill in the art, at the time of the invention, to consider

Moore's database translation system to be an obvious variation of the database translation

system described in the instant application. Placement of data in one cell or another, is

irrelevant. A searchable, logical storage location is provided by Moore to be used to

convert source code into an intermediate format, in the form of a database, and further to

convert into an object code program.

52. The method according to claim 51, which further comprises:

-assigning details of data types of at least one interface to at least one second specific row

in the first dimension in the intermediate format table;

-inserting designations for the data types associated with the at least one link in each cell

located at an intersection of the second specific row and the rows in the second

dimension with the designations of at least one link;

-defining the data types of the at least one interface assigned to the at least one program

code object and associated with the at least one link.

(See limitations as addressed in claim 38 above.)

53. The method according to claim 52, which further comprises:

-assigning details of data types of at least one constant in at least one of

-an object; and

-an external constant, to at least one third specific row in the first dimension 10 in

the intermediate format table, the details to be used by all the objects;

-assigning designations of at least one of:

-constant; and

-external constant, to at least one first specific row in the second dimension;

-inserting designations for the data type associated with the at least one constant in each

cell located at an intersection of the at least one third specific row and the at least one

first specific row in the second dimension with designations of the at least one constant;

and -defining at least one of:

-an internal constant; and

-an external constant, in at least one of:

-one program code object; and

-a general part of the object program code.

(See limitations as addressed in claim 39 above.)

54. The method according to claim 53, which further comprises:

-assigning details of one of a value and a method of calculation of at least one of:

-the internal constant; and

-the external constant, to at least one fourth specific row in the first dimension in

the intermediate format table;

-inserting the one of the value and the method of calculation of the at least one constant

in each cell located at an intersection of the fourth specific row and the first specific rows

in the second dimension with designations of the at least one constant;

-assigning the one of the value and the method of calculation of the at least one constant

to the at least one constant defined in the program code.

(See limitations as addressed in claims 39 and 40 above.)

55. The method according to claim 54, which further comprises:

-assigning details of the one of the value and the method of calculation of the at least one

link to at least one fifth specific row in the first dimension in. the intermediate format

table;

-inserting the one of the value and the method of calculation of the at least one link in

each cell located at an intersection of the at least one fifth specific row and at least one of:

    -one of the rows in the second dimension with the designation of an internal link;

and

    -the rows in the second dimension with the designation of an external link; and

-assigning the one of the value and the method of calculation of the at least one link to the

link created in the object program code.

(See limitations as addressed in claim 41 above.)

56. The method according to claim 51, which further comprises:

-assigning details of the designations of at least one of:

    -the at least one object;

    -the at least one link; and

    -the at least one constant, to specific title rows in the intermediate format table;

-inserting the designations in cells in the title rows; and

-naming the at least one program code object of at least one of

-the at least one link; and

-the at least one constant, based on the designations in the cells in the title rows in

the intermediate format table.

(See limitations as addressed in claim 42 above.)

57. The method according to claim 51, which further comprises:

-inserting a cross-reference to a sub format table in at least in one cell in a row in the first

dimension associated with an object; and

-linking the program code object produced from the object to subprogram code produced

from the sub format table.

(See limitations as addressed in claims 49 and 50 above.)

58. The method according to claim 51, which further comprises:

-inserting a cross reference to a source code program stored as a separate unit at least in

one cell in the row in the first dimension associated with an object; and

-linking the program code object produced from the at least one object to the source code

program stored as a separate unit.

(See limitations as addressed in claim 49 and 50 above.)

59. An intermediate format table for storing interface information contained in program

code in a computer system, the program code defining objects, at least one link including

at least one internal link between objects and at least one external link, at least one

interface including at least one output interface and at least one input interface, the table

comprising:

-dimensions including at least a first dimension and a second dimension;

-first rows disposed in said first dimension;

-second rows disposed in said second dimension;

-some of said second rows crossing said first rows to form intersections;

-cells disposed at said intersections;

-said first rows assigned designations for at least one object in a program code;

-said second rows assigned at least one of:

    -designations for at least one internal link between objects; and

    -designations for at least one external link of the program code; and

-each of said cells located at an intersection of one of said first rows having a designation

of an object for at least one of

    -an output interface; and

    -an input interface, associated with both a respective object and a respective

internal link;

-each of said cells located at an intersection of one of said second rows having a

designation of an internal link for at least one of:

    -an output interface; and

    -an input interface, associated with both a respective object and a respective

internal link;

-each of said cells located at an intersection of one of said first rows having a designation

of an object for at least one of

-an output interface; and

-an input interface, associated with both a respective object and a respective external link; and

-each of said cells located at an intersection of one of said second rows having a designation of an external link for at least one of:

-an output interface; and

-an input interface, associated with both a respective object and a respective external link.

(See Abstract, lines 1-15.)

60. The table according to claim 59, wherein:

-the at least one external link has an external interface with modes, the modes each having details;

-said first rows include a first specific row indicating one of the modes of the external interface; and

-the details of the one mode are inserted in each of said cells disposed at an intersection of said first specific row and said second rows with the designations of the at least one external link.

(Moore: Col. 4, lines 20-col. 9, line 21, regarding database creation.)

61. The table according to claim 60, wherein:

-the at least one interface has data types with details;

-said first rows include at least one second specific row assigned the details of the data

types of the at least one interface,

-the at least one internal link and the at least one external link have data types; and

-each of said cells located at an intersection of said second specific row and said second

rows with the designations of at least one of the at least one internal link and the at least

one external link has a respective designation for the data types associated with the at

least one link.

(Moore: See Database Creation, col. 4, line 20- col. 9, line 21.)

62. The table according to claim 61, wherein:

-the program code includes at least one constant including:

>-an internal constant having a designation and data types with details; and

>-an external constant having a designation and data types with details

-said first rows include at :Least one third specific row assigned the details of the data

types of the at least one constant;

-said second rows have first specific rows assigned the designation of the at least one

constant;

-each of said cells located at an intersection of said third specific row and said first,

specific rows contain designations for data types associated with the at least one constant.

(Moore: See Database Creation, col. 4, line 20- col. 9, line 21.)

63. The table according to claim 62, wherein:

the at least one constant has one of:

-a value with details; and

-a method of calculation with details;

-said first rows include at least one fourth specific row assigned details of the one of the

value and the method of calculation; and

-each of said cells located at an intersection of said at least one fourth specific row and

said first specific rows with designations of the at lease one constant contains the one of

the value and the method of calculation.

(Moore: See Database Creation, col. 4, line 20- col. 9, line 21.)

64. The table according to claim 63, wherein:

-the at least one link has one of:

-a value with details; and

-a method of calculation with details;

-said first rows include at least one fifth specific row assigned details of the one of the

value and the method of calculation; and

-each of said cells located at an intersection of said at least one fifth specific row and at

least one of:

-said second rows with the designation of an internal link; and

-said second rows with the designation of an external link, contains the one of the

value and the method of calculation of the at least one link.

(Moore: See Database Creation, col. 4, line 20- col. 9, line 21.)

65. The table according to claim 58, wherein:

-the at least one object has an original designation with r details;

-the at least one link has an original designation with details;

-the program code includes at least one constant having an original designation with

details;

-specific title rows have title row cells;

-said specific title rows are assigned details of the original designations of the at least one

object, the at least one link, and the at least one constant; and

-said title row cells have the original. designations of the at least one object, the at least

one link, and the at least one constant.

(Moore: See Database Creation, col. 4, line 20- col. 9, line 21.)

66. The table according to claim 58, wherein:

-the at least one interface has

-a mode;

-a data type;

-a default value;

-details of a data type conversion function to be applied to the at least one

interface; and

-designations including:

-an identifier for a respective interface; and

-at least one detail selected from the group consisting of:

-an identification of the mode of the at least one interface;

-an identification of the data type of the at least one interface;

-an identification of the default value; and

-an identification of the details of the data type conversion function

to be applied to the at least one interface.

(Moore: See Database Creation, col. 4, line 20- col. 9, line 21.)

67. The table according to claim 58, wherein said cells selectively contain annotations to

control programs for analyzing at least one of:

-information contained in the intermediate format table; and

-information for a user.

(Moore: Col. 1, lines 61-64, placement system, col. 2, lines 19-21, "...placement system

may create output design files defining the selected positions of the groups and

input/output buffers.".)

68. The table according to claim 67, wherein:

-said dimensions include at least one further dimension allocated to said annotations;

-said further dimension has further rows assigned with specific types of annotations; and

-an annotation to be used is used at intersections of said further rows in said first and

second dimensions governing said annotation with a respective one of said further rows

assigned to a type of annotation to be used.

(Moore: FIG. 4, database structure and pointer to a list.)

Conclusion

4.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Note: US Patent 6,581,191 B1 to Schubert et al. Col. 9, 'objects', col. 21-22, compile HDL to intermediate state and store in database and fabricate circuit.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Steelman, whose telephone number is (703) 305-4564. The examiner can normally be reached Monday through Thursday, from 7:00 AM to 5:30 PM If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam can be reached on (703) 305-4552. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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08/30/2004

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